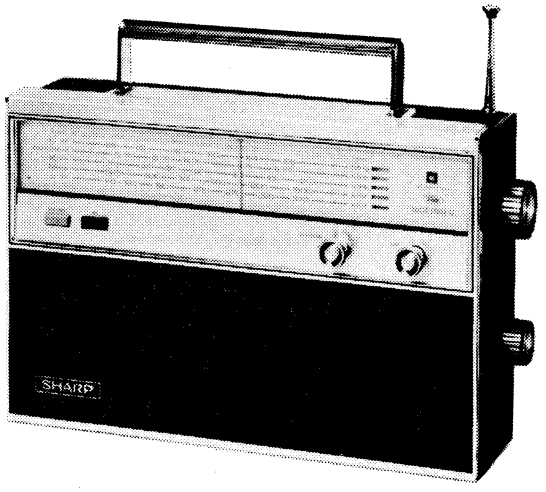
SHARP Service Manual



MODEL

FV-507

SPECIFICATIONS

Frequency Range
- LW .....150—370kHz
- MW .....520—1620kHz
- SW1 .....3.9—12MHz
- SW2 .....5.95—6.2MHz
- FM .....88—108MHz

Intermediate Frequency
- AM 455kHz
- FM 10.7MHz

Power Supply
- DC .....6V(UM-2×4)
- AC 220V

Power Output
- Undistorted 1W
- Maximum 1.5W

Speaker .....13cm×9cm(5-1/8″×3-1/2″) P.D.S. V.C.imp. 8ohm

Dimensions .....28.6cm(W)×18.2cm(H)×7.5cm(D) (11-1/4″×7-1/8″×3″)

Weight .....2.5kg(5.5 lbs.) without batteries

Transistor Complement

Q1 2SC394Ⓨ .....FM RF Amp.
Q2 2SC394Ⓞ .....FM Converter
Q3 2SC372Ⓨ .....AM Oscillator
Q4 2SC380Ⓡ .....1st FM IF Amp. & AM Mixer
Q5 2SC380Ⓞ .....2nd FM IF & 1st AM IF Amp.
Q6 2SC380Ⓞ .....3rd FM IF Amp. & 2nd AM IF Amp.
Q7 2SC372Ⓨ .....Audio Amp.
Q8 2SB422② .....Audio Driver
Q9,Q10 2SB364 .....Output
Q11 2SB422① .....AVR
Q12 2SC372Ⓨ .....AVR

GENERAL DESCRIPTION

The circuit used in this 5 band portable radio incorporates 12 transistors, 11 diodes and 1 thermister.
A ferrite bar antenna feeds AM broadcasting signal to the AM mixer. A telescopic rod antenna feeds AM broadcasting signal to the mixer, 2 IF amplifiers and a diode detector.
A telescopic rod antenna feeds FM broadcasting signal to the FM RF amplifier, FM converter, 3 IF amplifiers and 2 diode FM detector, then the signal passes through a 4 transistor audio amplifier circuit.
An AM AVC voltage is fed back to the 1st IF amplifier.
A FM AVC voltage is fed back to the FM RF amplifier.
An AFC voltage is fed back to the FM converter.

CHASSIS REMOVAL

1. Unloose 4 knobs on the front and side cabinets.
2. Unloose 5 screws retaining the cabinet.
3. Remove the cabinet.
4. Remove the antenna connecting terminals from the printed circuit board.
5. Unloose 5 screws retaining the chassis.
6. Remove the AFC switch.
7. Remove the dial pointer cord.
8. Carefully pull out the chassis.

SHARP CORPORATION OSAKA, JAPAN

GENERAL ALIGNMENT INSTRUCTIONS

Should it become necessary at any time to check the alignment of this receiver, proceed as follows;

1) Connect an output meter across the speaker voice coil lugs.
2) Set the volume control for maximum.
3) Attenuate the signals from the generator enough to swing the most sensitive range of the output meter.
4) Use a non-metallic alignment tool.
5) Repeat adjustments to insure good results.

ALIGNMENT CHART

	Signal generator			Receiver		Adjustment
Step	Band	Connection to receiver	Input signal frequency	Dial setting	Remarks	
1	MW	Connect signal generator through a 10K ohm dummy to the antenna tuning condenser. Ground lead to the receiver chassis.	Exactly 455kHz (400Hz, 30%, AM modulated)	Tuning gang fully open. (minimum capacity)	Adjust for maximum output on speaker voice coil lugs.	T6 T4 T2
2	MW	Use radiation loop. Loop of several turns of wire, or place generator lead close to receiver for adequate signal pickup. Generator output to one end of this wire.	Exactly 600kHz (400Hz, 30%, AM modulated)	600kHz	Same as step 1	Adjust the MW oscillator core (L8), and then adjust the MW antenna coil (L11). (SEE NOTE A)
3	MW	Same as step 2	Exactly 1200kHz (400Hz, 30%, AM modulated)	1200kHz	Same as step 1	Adjust the MW oscillator trimmer (C12), and then adjust the MW antenna trimmer (C8). (SEE NOTE A)
4	MW	Repeat steps 2 and 3 until no further improvement can be made.				
5	LW	Same as step 2	Exactly 180kHz (400Hz, 30%, AM modulated)	180kHz	Same as step 1	Adjust the LW oscillator core (L7), and then adjust the LW antenna coil (L11). (SEE NOTE A)
6	LW	Same as step 2	Exactly 3200kHz (400Hz, 30%, AM modulated)	320kHz	Same as step 1	Adjust the LW oscillator trimmer (C11), and then adjust the LW antenna trimmer (C7). (SEE NOTE A)
7		Repeat steps 5 and 6 until no further improvement can be made.				
8	SW1	Same as step 2	Exactly 4.5MHz (400Hz, 30%, AM modulated)	4.5MHz	Same as step 1	Adjust the SW oscillator core (L9), and then adjust the SW antenna core (L2).
9	SW1	Same as step 2	Exactly 10MHz (400Hz, 30%, AM modulated)	10MHz	Same as step 1	Adjust the SW oscillator trimmer (C13), and then adjust the SW antenna trimmer (C9).
10		Repeat steps 8 and 9 until no further improvement can be made.				

Step	Band	Signal generator: Connection to receiver	Signal generator: Input signal frequency	Receiver: Dial setting	Receiver: Remarks	Adjustment
11	SW2	Radiated as small as possible.	Exactly 5.93MHz (400Hz, 30%, AM modulated)	Tuning gang fully closed.	Same as step 1	Oscillator coil L10
		Same as above	Exactly 6.22MHz (400Hz, 30%, AM modulated)	Tuning gang fully open.	Same as step 1	Oscillator trimmer C14
		Repeat until no further improvement can be made.				
12	SW2	Radiated as small as possible.	Exactly 6.1MHz (400Hz, 30%, AM modulated)	Tune to signal.	Same as step 1 (SEE NOTE A)	Antenna trimmer C10

NOTE A

Check the alignment of the receiver antenna coil by bringing a piece of ferrite (such as a coil slug) near the antenna loop stick, then a piece of brass. If ferrite increases output, loop requires more inductance. If brass increases output, loop requires less inductance. Change loop inductance by sliding the bobbin toward the center of ferrite core to increase inductance, or away to decrease inducctance.

ALIGNMENT CHART

Step	Band	Signal generator: Connection to receiver	Signal generator: Input signal frequency	Receiver: Dial setting	Receiver: Remarks	Adjustment
1	FM	Connect signal generator through a 5PF dummy to test point TP-1. Generator ground lead to the receiver chassis.	Exactly 10.7MHz (400Hz, 30%, AM modulated)	Tuning gang fully closed. (maximum capacity)	Connect VTVM between test point TP-2 and chassis ground.	Detune T 7 and T 8. Tune T 1, T 3 and T 5 for maximum indication.
2	FM	Same as step 1	Exactly 10.7MHz (unmodulated)	Same as step 1	SEE NOTE B.	SEE NOTE B.
3	FM	Connect signal generator through a 75 ohm resistor including output impedance of signal generator to the telescopic rod antenna. Ground lead to the receiver chassis.	Exactly 88MHz (400Hz, 30%, FM modulated)	88MHz	Adjust for maximum output on speaker voice coil lugs.	Adjust the FM oscillator coil (L6), and then adjust the FM RF coil (L4).
4	FM	Same as step 3	Exactly 108MHz (400Hz, 30%, FM modulated)	108MHz	Same as step 3	Adjust the FM oscillator trimmer (C6), and then adjust the FM RF trimmer (C5).
5	FM	Repeat steps 3 and 4 until no further improvement can be made.				

NOTE B

1) Connect VTVM (0.1 volt range DC scale) between test point TP-3 and chassis ground.
2) Adjust T 8 for 0 volt.
3) Change signal generator frequency 10.7MHz + 100kHz and −100kHz approx.
4) Adjust T 7 for balanced peaks. Peak separation should be approx. 200kHz.

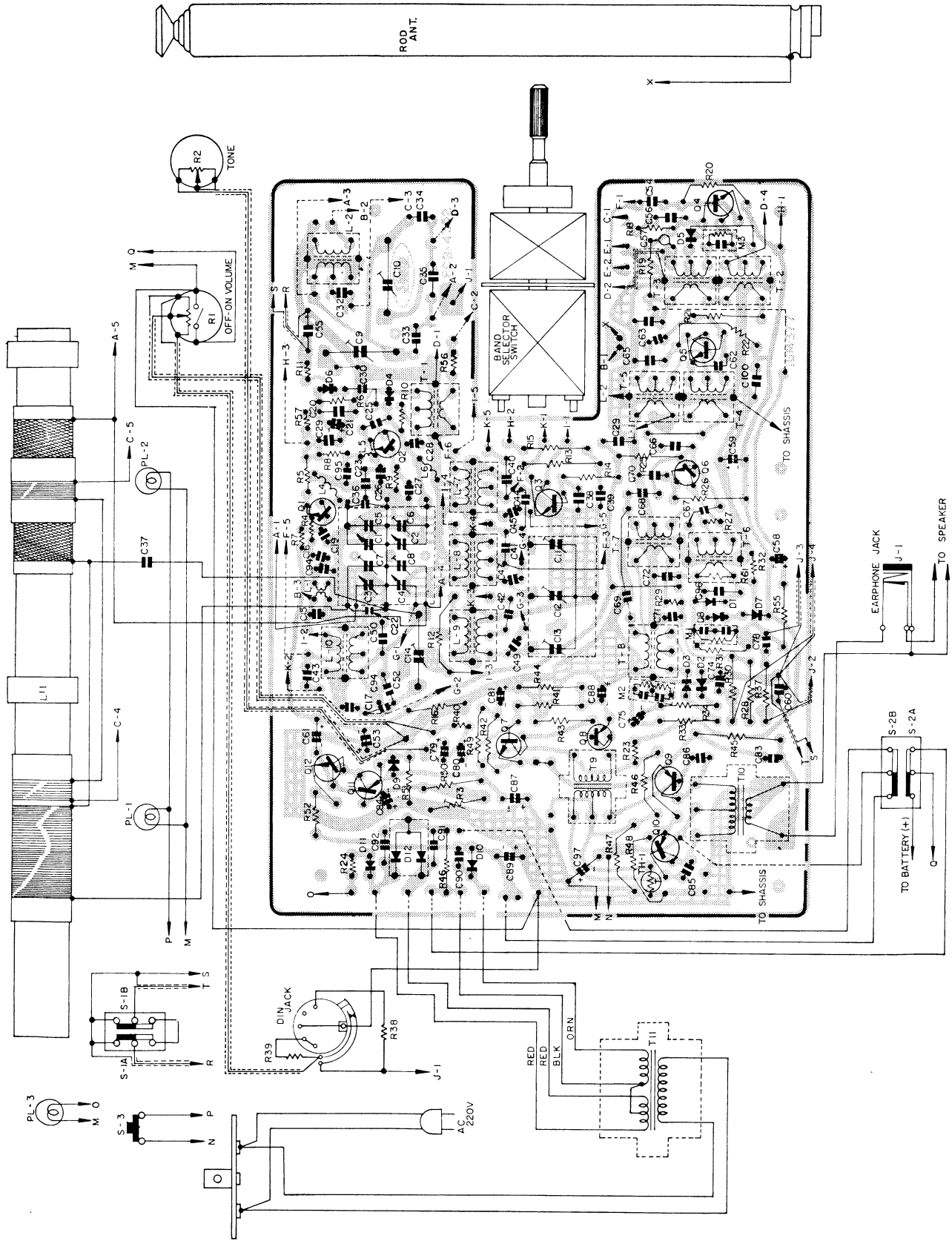
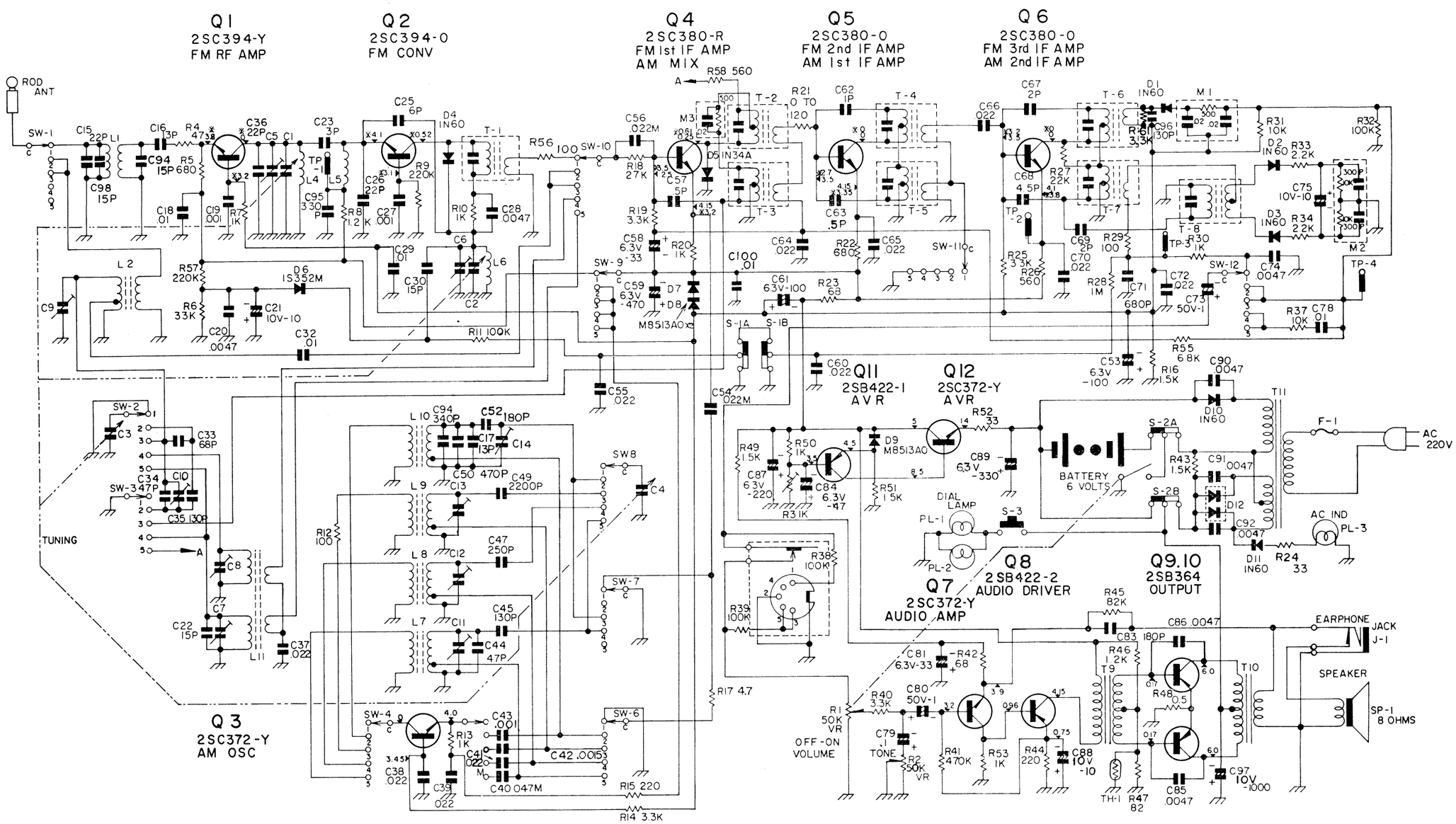


Figure 1 Wiring Side of P.V.B.



NOTES

1 FREQ RANGE

MW	520	—	1620 KHz
LW	150	—	370 KHz
SW_1	39	—	12 MHz
SW_2	5.95	—	6.2 MHz
FM	88		108 MHz
IF	AM 455 KHz		
	FM 10.7 MHz		

2 BAND SELECTOR SWITCH SW1-SW12 IS IN FM POSITION
3 CAPACITANCE VALUES FROM ARE IN MFD P= MMFD
4 RESISTANCE VALUES FROM ARE IN OHMS K= 1000
5 VOLTAGE RADINGS TO COMMON GROUD (+) ARE MEASURED WITH V.T.V.M UNDER NO SIGNAL CONDITIONS
6 VOLTAGE MARKED WITH ※ ARE MEASURED IN FM POSITION

Figure 2 Schematic Diagram

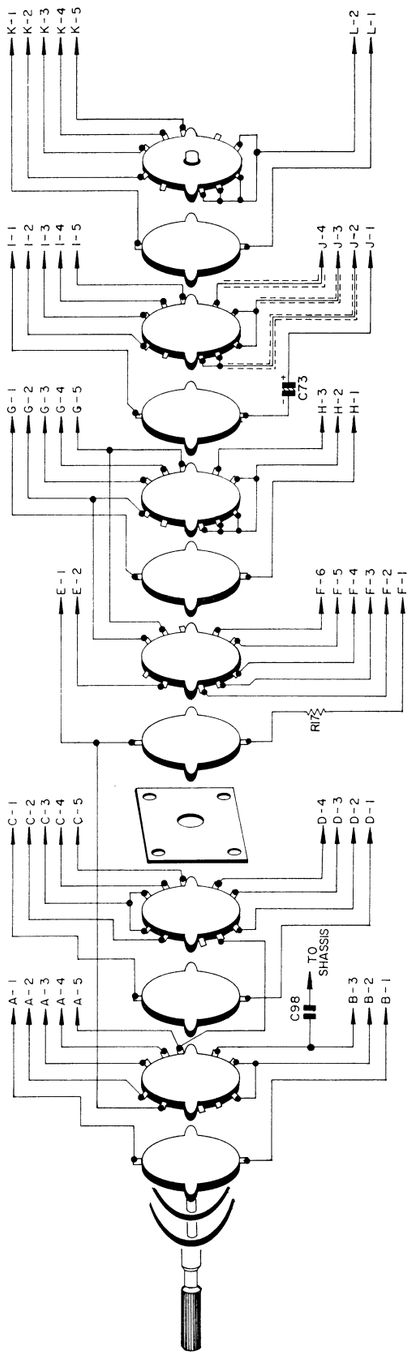


Figure 3 Band Selector Switch

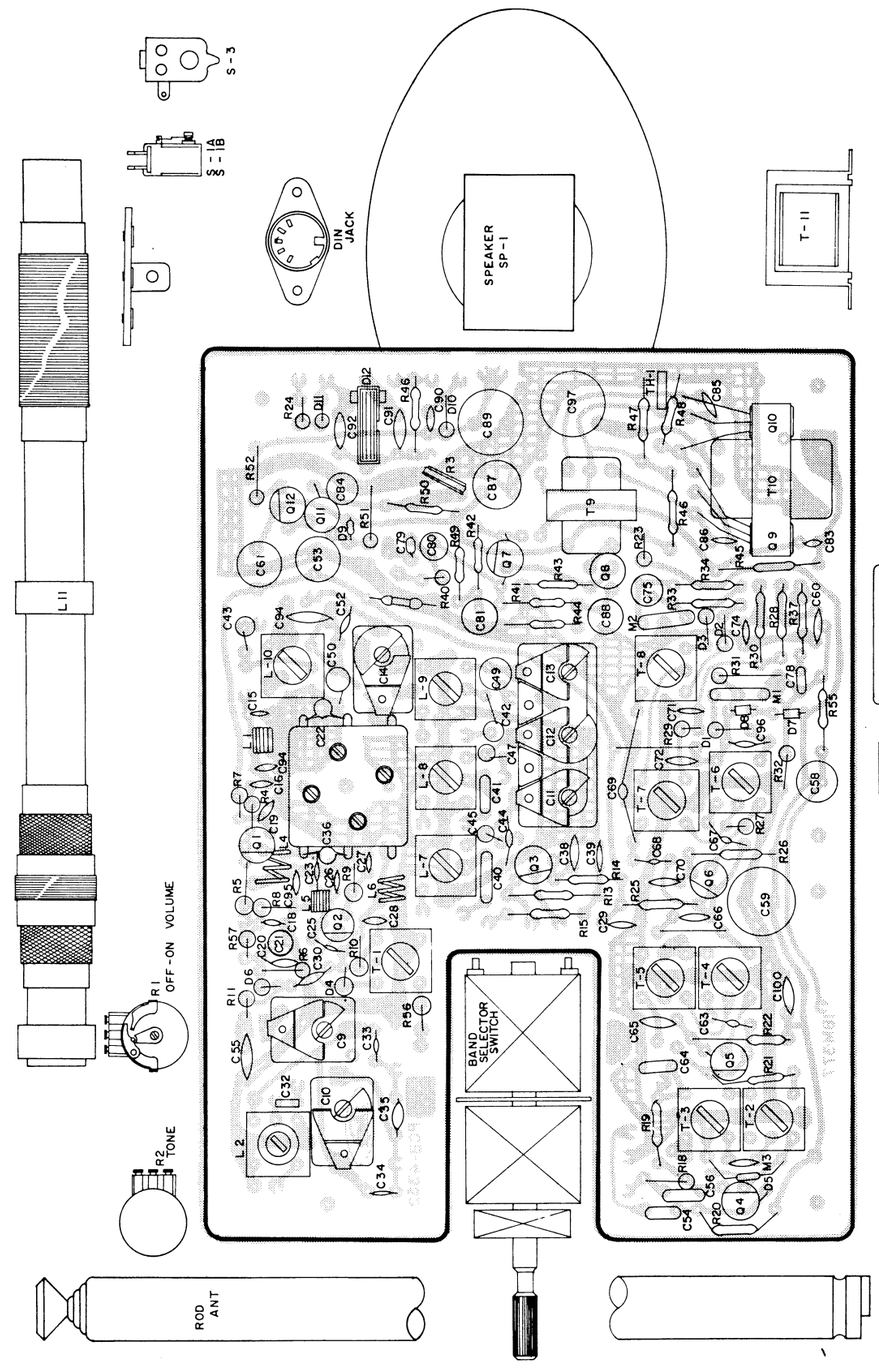
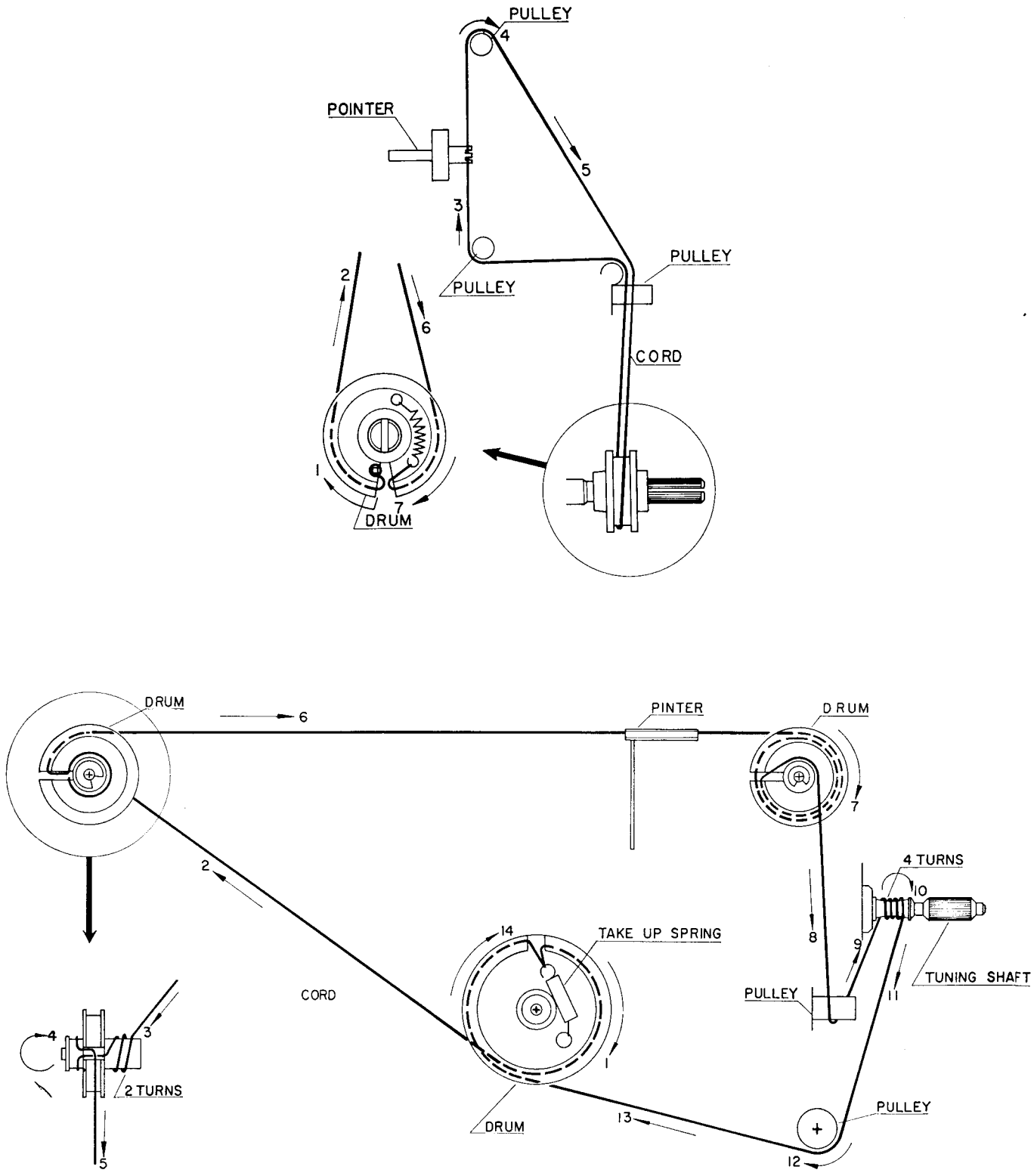


Figure 4 Component Side of P.C.B.



Figuer 5 Dial Cord Stringing

PARTS LIST

CAPACITORS

REF. NO.	PART NO.	DESCRIPTION	PART NAME
C1, C2, C3, C4, C5, C6, C7, C8	1560243500	Variable Tuning Gang with Trimmer	(VC-435)
C9, C10	1560282500	Trimmers	(TO-825)
C11, C12, C13	1560283200	Trimmers	(TO-832)
C14	1560270200	Trimmers	(TO-702)
C15, C26 C36	1552222817	22PF, 50V, 5%, Discap	(D-5-228J)
C16, C17	1552213817	13PF, 50V, 5%, Discap	(D-5-138J)
C18, C29, C100	1552614300	.01MFD, 50V, Discap	(D-5-105Z)
C19, C27	1552612700	.001MFD, 50V, Discap	(D-5-106Z)
C20, C28	1552613700	.0047MFD, 50V, Discap	(D-5-476Z)
C21, C75, C88	1661210222	10MFD, 10V, Electrolytic	(CU-1-102Q)
C22, C94, C98	1552215817	15PF, 50V, 5%, Discap	(D-5-158J)
C23	1552230917	3PF, 50V, .25PF, Discap	(D-5-309C)
C25	1657641700	6PF, 50V, 5%, Discap	(DCH-5-609J)
C30	1657641800	15PF, 50V, 5%, Discap	(DCH-5-158J)
C32, C78	1556210537	.01MFD, 50V, 20%, Mylar	(ML-5-105M)
C33	1552268817	68PF, 50V, 5%, Discap	(D-5-688J)
C34, C44	1552247817	47PF, 50V, 5%, Discap	(D-5-478J)
C35, C96	1552213717	130PF, 50V, 5%, Discap	(D-5-137J)
C37, C38, C39, C60, C64, C65, C66, C70 C72	1552222537	.022MFD, 50V, 20%, Discap	(D-5-225M)
C40	1556247537	.047MFD, 50V, 20%, Mylar	(ML-5-475M)
C41, C54, C55, C56	1556222537	.022MFD, 50V, 20%, Mylar	(ML-5-225M)
C42	1558215617	.0015MFD, 50V, 5%, Styrol	(S-5-156J)
C43	1558210617	.001MFD, 50V, 5%, Styrol	(S-5-106J)
C45	1558213717	130PF, 50V, 5%, Styrol	(S-5-137J)
C47	1558225717	250PF, 50V, 5%, Styrol	(S-5-257J)
C49	1558222617	.0022MFD, 50V, 5%, Styrol	(S-5-226J)
C50	1558247717	470PF, 50V, 5%, Styrol	(S-5-477J)
C51	1552239817	39PF, 50V, 5%, Discap	(D-5-398J)
C52, C83	1552218717	180PF, 50V, 5%, Discap	(D-5-187J)
C53, C61	1661210111	100MFD, 6.3V, Electrolytic	(CU-06-101Q)
C57, C63	1552205917	.5PF, 50V, .25PF, Discap	(D-5-059C)
C58, C81	1661233211	33MFD, 6.3V, Electrolytic	(CU-06-332Q)
C59	1661247111	470MFD, 6.3V, Electrolytic	(CU-06-471Q)
C62	1552210917	1PF, 50V, .25PF, Discap	(D-5-109C)
C67, C69	1552220917	2PF, 50V, .25PF, Discap	(D-5-209C)
C68	1552245927	4.5PF, 50V, .5PF, Discap	(D-5-459D)
C71	1552268717	680PF, 50V, 5%, Discap	(D-5-687J)
C73, C80	1661210327	1MFD, 50V, Electrolytic	(CU-5-103R)
C74, C85 C86, C90 C91, C92	1556247637	.0047MFD, 50V, 20%, Mylar	(ML-5-476M)
C79	1658310411	.1MFD, 6.3V, 20%, Electrolytic	(AD-06-04M)
C84	1661247211	47MFD, 6.3V, Electrolytic	(CU-06-472Q)
C87	1661222111	220MFD, 6.3V, Electrolytic	(CU-06-221Q)
C89	1661233111	330MFD, 6.3V, Electrolytic	(CU-06-331Q)
C94	1657644700	340PF, 50V, 5%, Discap	(DSH-5-347J)
C95	1552233717	330PF, 50V, 5%, Discap	(D-5-337J)
C97	1661210011	1000MFD, 10V, Electrolytic	(CU-1-100Q)

RESISTORS

REF. NO.	PART NO.	DESCRIPTION	PART NAME
R1	1548285700	50K ohm, Off-On/ Volume Control	(8V-857)
R2	1548285600	50K ohm, Tone	(8V-856)
R3	1548277500	1K ohm, Pot.,	(8V-775)
R4	1545247021	47 ohm	(¼SU-47K)
R5	1545268121	680 ohm	(¼SU-680K)
R6	1545233321	33K ohm	(¼SU-33KK)
R7, R10	1545210221	1K ohm	(¼SU-1KK)
R8	1545212221	1.2K ohm	(¼SU-1.2KK)
R9, R57	1545222421	220K ohm	(¼SU-220KK)
R11	1545210421	100K ohm	(¼SU-100KK)
R12, R29, R56	1544210121	100 ohm	(¼SA-100K)
R13, R20, R30, R50, R53	1544210221	1K ohm	(¼SA-1KK)
R14, R19, R25, R40, R61	1544233221	3.3K ohm	(¼SA-3.3KK)
R15, R44	1544222121	220 ohm	(¼SA-220K)
R16, R43, R49, R51	1544215221	1.5K ohm	(¼SA-1.5KK)
R17	1544247821	4.7 ohm	(¼SA-4.7K)
R18	1544227321	27K ohm	(¼SA-27KK)
R21	1544212121	120 ohm	(¼SA-120K)
R22	1544268121	680 ohm	(¼SA-680K)
R23, R42	1544268021	68 ohm	(¼SA-68K)
R24, R52	1544233021	33 ohm	(¼SA-33K)
R26, R58	1544256121	560 ohm	(¼SA-560K)
R27	1545222321	22K ohm	(¼SU-22KK)
R28	1544210521	1 Meg ohm	(¼SA-1MK)
R31, R37	1544210321	10K ohm	(¼SA-10KK)
R32, R38, R39	1544210421	100K ohm	(¼SA-100KK)
R33, R34	1544222221	2.2K ohm	(¼SA-2.2KK)
R41	1544247421	470K ohm	(¼SA-470KK)
R45	1544282321	82K ohm	(¼SA-82KK)
R46	1544212221	1.2K ohm	(¼SA-1.2KK)
R47	1545282021	82 ohm	(¼SU-82K)
R48	1544205821	0.5 ohm	(¼SA-0.5K)
R55	1544268221	6.8K ohm	(¼SA-6.8KK)

PACKAGED CIRCUITS

M1	1656630300	Capristor	(PRC-303)
M2	1656640300	Capristor	(PRC-403)
M3	1656633100	Capristor	(PRC-331)

PARTS LIST

SEMICONDUCTORS

REF. NO.	PART NO.	DESCRIPTION	PART NAME
Q1	1527213602	Transistor, FM RF Amp.	2SC394Ⓨ
Q2	1527213001	Transistor, FM Converter	2SC394Ⓞ
Q3	1527216804	Transistor, AM Oscillator	2SC372Ⓨ
Q4	1527213101	Transistor, 1st FM IF Amp. & AM Mixer	2SC380Ⓡ
Q5	1527213102	Transistor, 2nd FM IF Amp. & 1st AM IF Amp.	2SC380Ⓞ
Q6	1527213102	Transistor, 3rd FM IF Amp. & 2nd AM IF Amp.	2SC380Ⓞ
Q7	1527216804	Transistor, Audio Amp.	2SC372Ⓨ
Q8	1527217602	Transistor, Audio Driver	2SB422
Q9, Q10	1527217568	Transistor, Output (Matched Pair)	2SB364
Q11	1527217601	Transistor, AVR	2SB422
Q12	1527216804	Transistor, AVR	2SC372Ⓨ
D1	1522270201	Diode, AM Detector	1N60
D2, D3	1522270208	Diode, FM Detector	1N60
D4	1522270201	Doide, FM Limiter	1N60
D5	1522270201	Diode, AM & FM Limiter	1N60
D6	1257271001	Diode, FM AFC	1S-352M
D7	1527272801	Diode, Bias Regulator	M8513A
D8	1527272801	Diode, Bias Regulator	M8513A
D9	1527272801	Diode, AVR	M8513A
D10	1522270201	Diode, Rectifier	1N60
D11	1522270201	Diode, Rectifier	1N60
D12	1523270105	Rectifier, Power	SELEN-701
TH-1	1527280601	Thermister, AOC	D91A

COILS AND TRANSFORMERS

L1	1508216702	Coil, MW/LW Antenna	(8L-167A02)
L2	1508220500	Coil, 49M Antenna	(8L-205A)
L3	1508217400	Coil, FM Antenna	(8L-174A)
L4	1507260200	Coil, FM RF	(7L-602C)
L5	1507295400	Coil, Emitter Choke	(7L-954)
L6	1507260200	Coil, FM Oscillator	(7L-602C)
L7	1507205100	Coil, LW Oscillator	(7L-051B)
L8	1507207600	Coil, MW Oscillator	(7L-076B)
L9	1508233700	Coil, SW Oscillator	(8L-337B)
L10	1508233800	Coil, 49M Oscillator	(8L-338B)
T1	1507287400	Transformer, 1st FM IF	(7IF-874)
T2	1507287100	Transformer, 1st AM IF	(7IF-871)
T3	1507287400	Transformer, 2nd FM IF	(7IF-874)
T4	1507287200	Transformer, 2nd AM IF	(7IF-872)
T5	1507287400	Transformer, 3rd FM IF	(7IF-874)
T6	1507287300	Transformer, AM Detector	(7IF-873)
T7	1507287500	Transformer, 4th FM IF	(7IF-875)
T8	1507287600	Transformer, FM Detector	(7IF-876)
T9	1516280100	Transformer, Input	(6T-801)
T10	1517283500	Transformer, Output	(7T-835)
T11	1515280800	Transformer, Power	(5T-808)

MISCELLANEOUS

REF. NO.	PART NO.	DESCRIPTION	PART NAME
	11032392	Cabinet	3CAB-4352
	11062829	Panal	PANEL-4168
	11092403	Knob, Tuning	9K-403
	11092490	Knob, Band Selector	9K-490
	11092405	Knob, Off-Volume Control	9K-405
	11092400	Knob, AFC	9K-406
	11092405	Knob, Tone Control	9K-405
	11202844	Pointer (A), Dial	SISIN4168A
	11202845	Pointer (B), Dial	SISIN4168B
	11213767	Dial	DIAL-4352
	11802709	Handle	TOTTE-4168
	11932242	Cover, Battery	B-BUTA4168
	1303237700	Printed Circuit Board	PCB-4352
	1385550700	Spring, Drum	SPRING
	1531240400	Switch, AC/Battery	X4S-4
	1533261200	Switch, AFC	36S-12
	1533211800	Switch, Band Selector	31S-18
	15332905	Switch, Pilot Lamp	39S-5
	1530213500	Jack, Earphone	J-135
	1570245000	Speaker	1309P-22H
	1571227758	Antenna, Rod	XRODANT 277
	1593250100	Lamp, Pilot (6V-30mA)	3PL-501
	1590241500	Earphone	MR-19
	15862706	Cord, AC	ACC-706